THEMEDA QUADRIVALVIS (POACEAE: ANDROPOGONEAE) IN KANSAS: AN EXOTIC PLANT INTRODUCED FROM BIRDSEED

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In November 1998, a peculiar grass growing in a residential yard in Wamego (Pottawatomie County), Kansas was submitted to the Herbarium at Kansas State University (KSC) for identification. The grass was identified as *Themeda quadrivalvis* (L.) Kuntze, a plant native to southeastern Asia. In the United States, this grass has been collected in Louisiana (Brown 1945) and Florida (Wunderlin 1998), presumably as an escapee from cultivation. A search of herbaria records revealed that *Themeda* also has been collected in California (RSA).

Themeda quadrivalvis can be recognized by the following description: Annual, 20–50 cm tall; blades papillose-ciliate on the lower margins; ligule membranous, lacerate, < 1 mm long; inflorescence a lax flabellate cluster of racemes, each subtended by a strongly keeled spathe; spikelet clusters with a fertile sessile spikelet surrounded by four infertile sessile spikelets and two infertile pedicellate spikelets, all partially enclosed by a spatheole; fertile spikelet terete, bearded, 4.7–7.2 mm long with a 3–4 cm long geniculate awn, disarticulating obliquely to form a pointed callus; infertile spikelets 4–5 mm long; flowering Sep–Oct. The specimens may be assigned to variety *helferi* based on the presence of tuberculate hairs on the involucral spikelets and the plant stature (Bor 1960). The inflorescence of *Themeda* is a complex arrangement of spikelet clusters that is described in greater detail by Baird and Thieret (1985).

In a follow-up examination of the collection site, eight additional *Themeda* plants were found growing under a bird feeder and in an unmowed area near the porch. The yard was semi-shaded, and the lawn was predominately crabgrass (*Digitaria sanguinalis*) and bluegrass (*Poa pratensis*). Microscopic examination of birdseed from the feeder found numerous *Themeda* spikelets among the thistle (*Guizotia abyssinica*: Asteraceae) seeds, indicating that it was the source of the introduction.

To determine if *Themeda* seeds were prevalent in birdseed, nine sacks of commercial thistle seed with different lot numbers were purchased and inspected thoroughly (30.1 kg of seed). All of the sacks contained *Themeda* and other contaminant seeds, which were removed and compiled. Three hundred of the *Themeda* seeds and numerous other unidentified seeds were planted in vermiculite in a 22° C greenhouse and monitored for five months. In the spring, an additional 900 *Themeda* seeds were broadcast sown in a

lawn dominated by crabgrass. The area was not fertilized or mowed during the growing season but did receive occasional supplemental water.

Themeda seeds removed from the birdseed were apparently inert. However, some *Vigna radiata* var. *radiata* (Fabaceae) and *Arthraxon hispidus* (Poaceae) seeds germinated in the greenhouse. Three unidentified dicotyledons also germinated but died before reaching maturity. Both *Vigna radiata* and *Arthraxon hispidus* are weedy annuals from southeastern Asia that have been introduced into the United States (Kartesz 1999).

One year after the initial collection, examination of the yard where *Themeda* was discovered did not find any recurrence of the grass. A floristic survey of numerous residential yards where thistle seed was fed to birds also did not detect any exotic plants. *Themeda* may be unable to persist in Kansas, but in Louisiana it has flourished for more than 40 years in disturbed sites near cultivated fields (Reese & Landry 1985).

India and Ethiopia are major producers of thistle for birdseed (Sharma 1982; Vincent & Cusick 1998), and *Themeda* seeds, as well as numerous other weedy species, are present in the harvested material. Although imported seeds are treated to prevent germination, the process is fallible. Contamination or inconsistent sterilization procedures apparently were responsible for introduction of *Themeda* into Kansas. The incidence of viable seeds in thistle may be small, but birdseed represents a potential source for adventive plants.

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